

Two interesting new insular *Rhinocypha* from Malaysia (Odon.)

by

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(with plates 2—3)

The naming and classification of species may not be a very exhilarating work, but it is absolutely necessary as a basis for research on broader geographical lines. Zoologists often have no interest in the animal as a living organism, or they have not the fortunate opportunity of studying their animals in the field and trying to find out where they exist, and why they exist just there. In other words, the animal is not studied and, as the able zoologist K. H. Barnard put it, made to tell its dramatic story. There is no unfolding of the drama until the inter-relationships of the *dramatis personae* are indicated. Therefore, in this short paper, I have endeavoured to offer slightly more than mere taxonomy so as to balance the dull descriptions, which are so often blamed.

Rhinocypha is the most characteristic genus of dragonflies of tropical Asia, striking both in respect of the great beauty and brilliance of its members and of the abundance of species. Not only do their wings display an inimitable play of scintillating colours, ranging through flashing blues, greens, purples, bronzes to gorgeous fiery coppery red, but the bodies in most cases are also gaily decorated with red and blue or yellow in many shades. The development of small clear areas or "windows" in such a wing as that of *fenestrata* only serves to heighten the effect of these radiant rainbow hues. They are easily recognised insects on account of their unusually short bodies and projecting "nose", whence the name.¹⁾

Although usually found perched on rocks in mid-stream, couples of males circling round one another may be observed above the water; and when courting, these "living gems of tropic streams" perform a kind of nuptial dance before the female, during which they make a great display of the white pulverulent flexor surface of the hinder pairs of tibiae. The legs are trailed and show up dazzlingly white in the strong sunshine.

Speaking only of the group with fenestrate wings, males — the more plastic and progressive sex — from different islands are found to differ constantly in certain characters; the females — the more conservative sex — are often indistinguishable throughout the whole

¹⁾ From *ῥίς* = nose, and *κυφός* = curved, bulged.

area. They have unmarked wings and are dull-coloured, sitting quietly on gravel and rocks in the stream bed, or congregating on the bare twigs of neighbouring trees or bushes. *Rhinocyphae* are very rarely seen pairing, but the females may occasionally be observed ovipositing, unattended by the male, on a piece of dead twig or rotten wood sticking between boulders in mid-stream (pl. 2 fig. 2). The *Rhinocyphae* are very particular as to the nature of their habitat, all of them being rigidly confined to well-aerated shady streams of forest-brooks in which they breed. I found the larva of *fenestrata* (fig. 1) among submersed grass and roots near the border of a creek, but they are especially fond of hiding among the bundles of fine aerial rootlets of lianas and other trees pending freely into the water of a stream.

From the point of view of zoogeography they are of considerable importance as, in the Malay Archipelago for instance, every large island has its own group of mostly endemic species. Taking into account only the four principal land-masses of Malaysia, we have listed a total of 25 species of which no less than 17 are precinctive, thus :

| Species | Malaya | Sumatra | Java | Borneo | Total |
|-------------------|--------|---------|------|--------|-------|
| Total | 4 | 8 | 4 | 9 | 25 |
| Endemic | 1 | 5 | 3 | 8 | 17 |

The Malay Peninsula has 3 species occurring also in Siam and Burma, one of which being found in Sumatra as well ; Sumatra has 1 species in common with Java, a second extends farther north into Siam and Indo-China, and of a third several distinct subspecies occur, one in Borneo, and others in smaller islands.

| Only → | Malaya Siam Burma | Malaya Siam, Burma Sumatra | Sumatra Java | Sumatra Borneo |
|---------------------|-------------------------|----------------------------------|-----------------|-------------------|
| Species | 1 | 1 | 1 | 1 |
| Subspecies. | 1 | — | — | — |
| Total | 2 | 1 | 1 | 1 |

No attempt has yet been made to establish mutual relationships, but the arrangement proposed above reflects the broadest possible view of a „species”. Hardly anything is yet known concerning the *Rhinocypha* fauna of the numerous smaller islands of Malaysia. the only regional islands where these stream-dwelling insects (only subspecies) had been found being Nias, the Anambas, and Palawan. Here follow the diagnoses of 2 new subspecies, one of the

Javan *fenestrata* (Burm.), from Bali, and one of the Sumatran *angusta* Selys, from Engano I. It is hoped to discuss a third new subspecies (of *angusta*, from Billiton) in a forthcoming analysis of the formenkreis *angusta*, which will not concern us here.

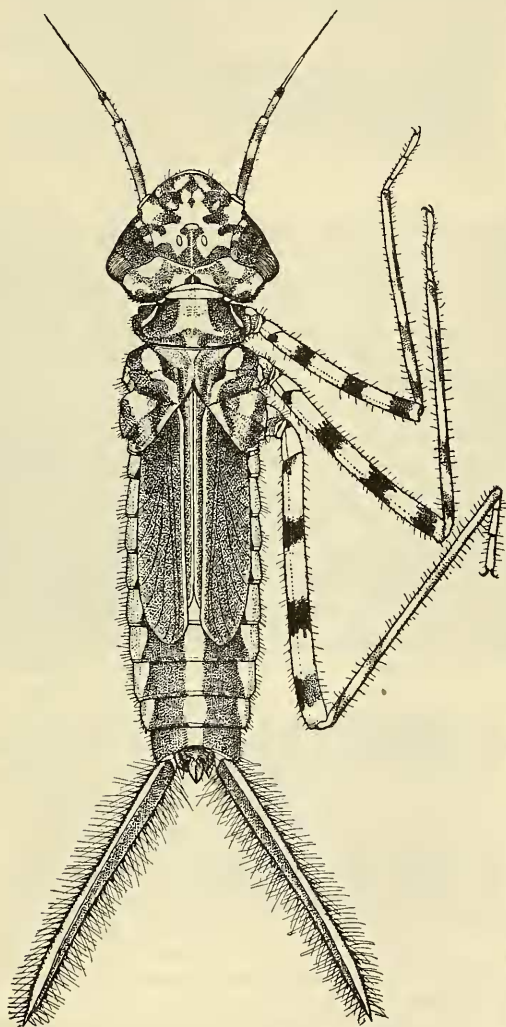


Fig. 1. *Rhinocypha* f. *fenestrata* (Burm.). Ultimate larval instar. Drawn from living specimen. W. Java, Tjibarangbang near Djasinga, 18.VII.1936. Total length (excl. caudal gills) 13 mm.

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Rhinocypha fenestrata cornelii, subsp.n. (pl. 2, fig. 1).

Material. — S. W. Bali, 1 ♂, Poeloekean forest-reserve, ca 200 m, in deep ravine, 3.IV.1936, C. G. G. J. van Steenis; id., 3 ♀, Tjandikesoema (coast), 1.1941, J. P. A. Kalis; Central S. Bali, 17 ♂, 8 ♀ (2 ♂ juv.), Mt. Batoekaoe, ca 700 m, Wonggaja-gede, 13.II.1940; Poepoean & Batoekaoe, 700 m, 10, 17 & 28.IV.1940; all W. Spies. Holotype ♂, Poeloekean, 3.IV.1936, C. van Steenis, in Mus. Buitenzorg.

♂ (ad.) — Size, colour and pruinescence of legs, coloration and markings on head, thorax and abdomen, identical to and showing the same individual variation as typical *fenestrata* from Java, of which many good descriptions exist in literature (Burm. 1839; Rambur 1842; Selys 1853, 1854; Schmidt 1934, Archiv Hydrob. suppl. 13 : 317—323, figs.).

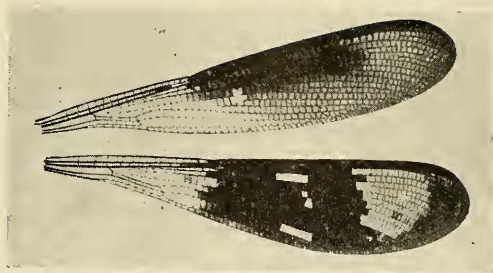
Fore wing. — Opaque area as in *fenestrata*, but the deepened area in costal half distinctly shorter, gradually shading off into the lighter brown area 4—5 cells proximal to *pt*; apical margin slightly darker than the area under *pt*. Darkest areas with low purplish-brown reflections, lighter opaque areas brilliant brass, golden or coppery-red.

Hind wing. — Opaque area extending from level of *nod* to apex of wing, this area of rather uniform depth between *nod* and inner boundary of the large apical sub-hyaline fenestra, very gradually a little lighter brown beyond this vitreous area; opaque area of the usual dark brown colour by transmitted light, with low purplish-brown (often partly metallic-blue or green) gloom by reflected light. Vitreous spots: irregular, proximal border of opaque area indented by a small spot, 4—5 cells long, between *Rs* and *M*₃; position of inner series of spots as in typical *fenestrata*, very variable, usually composed of 3 linear spots, 1—2—1 cells deep, respectively; outer series of spots fused and enormously enlarged, together roughly quadrate or subtriangular in outline, the inner border usually situated at the same level as in *fenestrata* (10—7 cells proximal to *pt*), the convex outer border either at level about mid-way *pt* (type and 9 paratypes), or removed distad and filling in the entire apex of the wing, in that case very gradually shading off into a narrow sub-opaque marginal crescent (6 out of 15 spec.), its costal border bounded by *M*₁ (rarely *Sc* or even *C*), its posterior border by *M*₃. All vitreous spots glow brilliant fiery cupreous, brass or golden by reflected light, the two basal series of spots occasionally magenta. In several paratypes the apical vitreous patch is partly or completely cut into two pieces by an invasion of the surrounding dark area, one cell deep, bounded by the 2nd supplement of *M*₃ and the vein *Rs*.

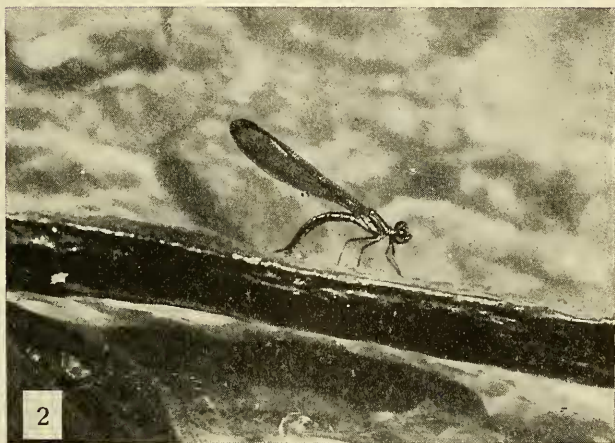
♀. — Not differing from that of typical *fenestrata*.

I have much pleasure in dedicating this new subspecies to its discoverer, Dr. Cornelis van Steenis, who on his botani-

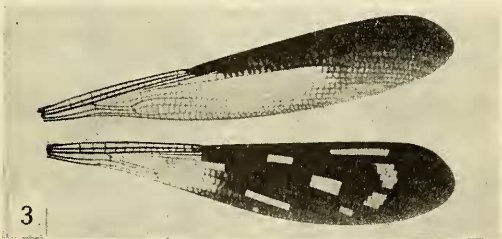
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F. Huysmans & M. A. Lieftinck phot.

M. A. Lieftinck: *Rhinocypha*.

Fig. 1. *Rhinocypha fenestrata cornelii*, subsp. n. ♂ S.W. Bali, right pair of wings (type). — Fig. 2. *R. f. fenestrata* (Burm.), ♀ ovipositing in wet bark of tree-branch, tributary stream of the Tjibarangbang (Djasinga, W. Java), 4.XII.1938 (Lieftinck phot.), nat. size. — Fig. 3. *R. angusta oceanis*, subsp. n. ♂ Engano I., right pair of wings (paratype). Wing-photographs enlarged.

cal trips collected several interesting Odonata in Sumatra, Bali and elsewhere.

The most striking characters of *f. cornelii* are the fusion of the distal series of vitreous spots and the absence of a sub-hyaline apical marginal zone on the hinder wings, which has resulted in the formation of a single large fenestra. In *f. fenestrata* only the apical fenestrae and the marginal seam are resplendent, whereas in *f. cornelii* by the extensive blending of the vitreous spots and the opacity of the margin, it is just the reverse: plus variants showing a fiery brilliance of the entire apex. In pl. 3 figs. 1—4 the minus and plus variants of *f. fenestrata* are shown, selected from 72 males from various localities in Java; of *f. cornelii* only one wing-photograph (type, minus variant) is available at present, the variation being described above (pl. 2 fig. 1).

Typical *fenestrata* is confined to Java and has no near allies. It ranges from the extreme western point of the island (Oedjoengkoelon game-reserve) to as far as the slopes of Mt. Raoeng in Besoeki; it is a very common insect on shady forest-streams, from sea-level up to about 900 m alt. In Sumatra (even in the extreme south) it is replaced by *R. angusta*, which it resembles superficially, whilst east of Wallace's Line (from Lombok eastwards) the totally different species-group of *R. pagenstecheri* makes its appearance. The discovery of a well-marked subspecies of *fenestrata* in Bali is thus of considerable interest. As I have shown elsewhere,¹⁾ there are no elements in the Balinese Odonate-fauna showing affinities with Wallacea, all species being of western origin and occurring also in Java. In addition to *R. f. cornelii*, recent acquisitions to the list are the mostly stenothermal and strictly rheophilous species: *Vestalis luctuosa*, *Euphaea variegata*, and *Notoneura insignis* among the Zygoptera, and *Onychothemis culminicola*, *Paragomphus reinwardti* and *Onychogomphus modestus fruhstorferi* among the Anisoptera. All of them reach the eastern limit of their range in Bali and several of these outliers have 'representative species' of only remote affinity in Lombok and further eastwards.

Rhinocypha angusta oceanis, subsp.n. (fig. 4—5 and pl. 2, fig. 3).

Material. — Centr. W. Engano, 25 ♂, 28 ♀ (mostly ad.), Boeah-boeah, ult. V—VII.1936, J. K. de Jong. Holotype ♂ and allotype ♀, 30.V.1936, in Mus. Buitenzorg.

♂ (ad.) — Labium yellow, the tips of the lobes and palpi black. Head black, light markings much reduced; genae with vestige of a yellow spot, anteclypeus with a diffuse reddish marginal streak, vertex with a pair of small oval ochreous spots, one on each side of the lateral ocelli, and a pair of similar, though still smaller points on the epicranial lobes.

¹⁾ *Revue Suisse Zool.* 43 (1936): 105.

Prothorax black with a yellow lateral point half-way down the sides and a pinkish triangular mark on the middle of the posterior lobe. Thorax throughout deep velvet-black, sides with low bronze shine; light markings greatly reduced, as shown in fig. 4 (lightest variant). Mesostigmal lamina citron-yellow; antehumeral patches and mesothoracic triangle (mesinterepisternum) coral-pink, or rufous, or light coral-red (*Ridgway*), lateral streaks or points yellow. Under surfaces entirely black, except the coxal and post-sternal membranes, which are whitish; occasionally two yellow points on middle portion of poststernum.

Legs black, inner surfaces of middle and posterior femora cream-buff, those of middle and posterior tibiae pruinulent white (identical to *a. angusta*).

Wings (pl. 2, fig. 3) shaped similarly to *angusta*; position and

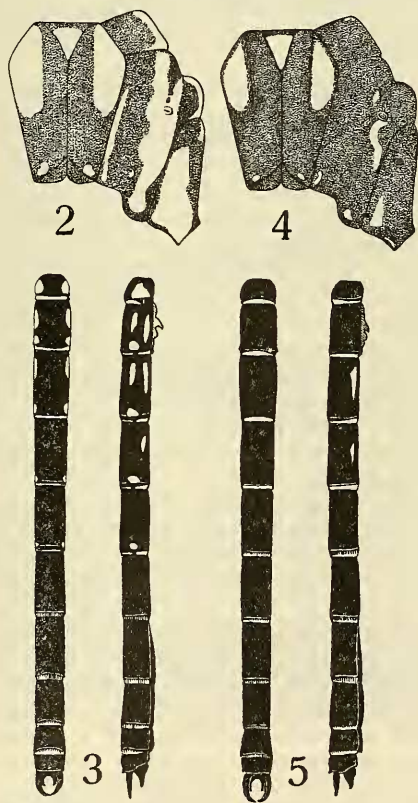


Fig. 2—5. Colour-pattern of synthorax, and same of abdomen (dorsal view and right side) of ♂ *Rhinocypha a. angusta* Selys, from S. Sumatra (fig. 2 & 3), and of *R. a. oceanis*, subsp. n., from Engano I. (fig 4 & 5, lightest variants).

colour of hyaline fenestrae on posterior wing and extent of opaque areas on both fore and hinder wing as in dark examples (plus variants) of the typical race. The only marked difference as compared with Sumatran *angusta* is found in the extent of the vitreous streak of first series (between R_s and M_3), which in *oceanis* averages shorter in length, covering only 12—16 cells instead of 20—28 in *angusta*. The opaque area on hinder wing extends approximately from nodus (or slightly before that level) to the apex, the post-nodal costal opaque area on fore wings being always broad and deeply tinted, beginning at the nodus and occupying at least part of the space between M_2 and R_s .

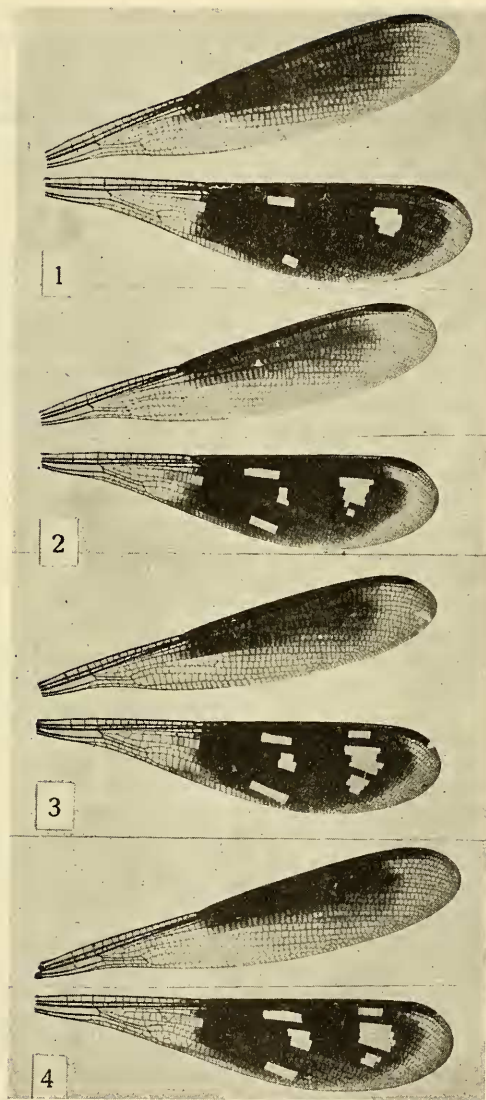
Abdomen throughout unicolorous bronze-black, with no other light markings than a fine, pale blue, ante-median lateral streak close to the ventral margin of segm. 3, and a tiny spot of the same colour on the middle of the sides of 4, this latter spot often absent altogether. Intersegmental rings whitish. Anal appendages black (fig. 5).

Paratypes. — In 9 out of 22 adult males, the light marks on the thorax are still more reduced than shown in fig. 4; the antehumeral spot is smaller and distinctly detached from the humeral suture, the sides being entirely black save for a vestigial spot on the metepimeron. In these extremely melanistic examples the light streaks on segm. 3—4 of abdomen have disappeared completely.

♀ (ad.) — Yellow spots and lines on head and prothorax similar to *angusta*, but all of them somewhat smaller in size. Thorax with the dorsum entirely black, lacking antehumeral bands; a fine yellow line, restricted to the middle of the humeral suture, a narrow undulated stripe on posterior part of metepisternum, a tiny streak just anterior to the spiracle, and a triangular patch on upper third of metepimeron; all these markings considerably smaller than in *a. angusta* (about $\frac{1}{3}$ of the size), but larger than in ♂. Venter black, slightly pruinulent. Legs black, only the inner surfaces of posterior femora slightly yellowish.

Abdomen with a fine mid-dorsal yellow line on segm. 2—7, interrupted on both ends on each segment, and tiny longitudinal, lateral streaks of yellow on 2—5, or 3—5, in addition to fine, transverse, pale laterobasal streaks on 3—7; otherwise black.

This striking new subspecies participates in the general melanosis of the body tegument which is manifest in various animals of different orders inhabiting Engano I. This insular melanism indicates some general cause of variation able to act upon totally distinct groups and producing upon them all a similar result. 9 out of the 23 species of Engano dragonflies, belonging to 3 different families, have a common modification, either in their wing-colour or in the colour-pattern of the body, by which they can be distinguished at a glance from the mainland races inhabiting Sumatra. To a less degree this insular melanism also occurs in



F. Huysmans phot.

M. A. Lieftinck: *Rhinocypha*.

Fig. 1—4. *Rhinocypha f. fenestrata* (Burm.), ♂ from Java. Right pair of wings, showing variation. — 1. Tjidaoen (S. Java), minus variant; 2. Pasaoeran (W. Java); 3. Tjidaoen (S. Java); 4. Tengger Mts. (E. Java), plus variant. All photographs enlarged.

animals from some other deeper water islands of the chain (Simaloer and the Mentawai Islands). Whatever may have been its cause, that cause must certainly have been long in action, an argument in favour of the early and long-continued isolation of Engano from Sumatra as well as from the smaller adjacent islands situated off the Sumatran westcoast. The exceptional wet climate of Engano is possibly also partly responsible for the general tendency to develop melanotic subspecies.

Although the wing-markings vary within limits, the opaque colour being slightly more extensive on the average than in typical *angusta* from Sumatra and Nias, the pattern of the wings of *oceanis* has remained unchanged, the melanosis having affected only the tegument of the body. This is of great interest, as in the insular subspecies *cornelii* of *R. fenestrata*, from Bali, it is just the reverse, the colour-pattern of the body exhibiting no differences whatever as compared with typical *fenestrata*, whilst the opaque colours and vitreous spots have undergone a fundamental change.
